Executive Overview

Introduction

The U.S. Census Bureau's mission is to be the preeminent collector and provider of timely, relevant and quality data about the people and economy of the nation. Successfully achieving this mission depends on the systems, the people, and the infrastructure that make up the Information Technology (IT) environment of the U.S. Census Bureau.

The U.S. Census Bureau's IT mission is to provide our employees and customers with the capability to readily collect, organize, share, protect, disseminate, and store the information needed to successfully accomplish their goals. We are centrally managing program requirements, policy formulation, planning, technical direction (including development and expansion of the IT architecture), oversight (including oversight of system development, IT acquisition and security) and day-to-day operations. The scope of the IT Directorate's mission encompasses centralized information and process management as well as providing direction for decentralized execution.

Census Modernization Initiative

As the U.S. Census Bureau enters the 21st Century and finishes work on the 2000 Decennial Census, we will need to significantly modernize our technological infrastructure, which will directly enhance our ability to produce timely quality data about the people and economy of this nation.

Our current infrastructure is based on technology from the 1960's, 70's, and 80's. We are using outdated systems, and are forced to rely on software and hardware that is becoming obsolete. We need to replace our "homegrown" solutions with commercially available technology.

This Census Modernization initiative (the only IT initiative submitted in this Plan and in our FY 2001 budget submission) begins the end-to-end modernization of the technology to support our censuses and surveys. The U.S. Census Bureau's core business processes are data collection, processing and dissemination; we intend to use information technology advances to improve our survey processes and meet our customers' increasing expectations. These advances provide us with an opportunity to make major improvements in our business processes and to successfully survive in an increasingly competitive survey data collection processing and dissemination market.

Specifically, this new initiative covers the following functions and capabilities:

- **obtaining a commercial off-the-shelf geographic information system to replace our Bureau-developed system (from the 70's) and convert its data;**
- **obtaining a Windows-based survey instrument to replace the current DOS-based system and convert its surveys;**
- **modernizing our Computer-Assisted Telephone Interviewing systems;**
- **exploring the effects and uses of a web-based reporting option for demographic surveys;**
- **implementing security measures throughout the electronic data collection systems;**
- **determining to what extent we can apply the Decennial Data Capture system to other censuses and surveys;**
- **researching and using workflow systems in the survey environment;**
- **enabling the American FactFinder system to provide access to additional data sets and results of surveys (beyond the three currently provided); and**
- **researching the practical application of emerging technologies to the survey processes.**

This list of functions and capabilities demonstrates that this initiative allows the U.S. Census Bureau to make major strides toward transforming the Department of Commerce into a "Digital" Department, and positions us to meet the requirements of the Office of Management and Budget Paperwork Elimination Act.

It is imperative that the Department of Commerce endorse this initiative in FY 2001 so we can take advantage of the technologies and lessons learned during Census 2000 and begin work in several areas in a coordinated fashion.

Plan Overview

This Plan describes our progress over the past year in implementing the goals (and the updated strategies to attain these goals) presented in our 1999 Strategic IT Plan. These goals are customer-driven, are designed to advance technology and improve our information systems, and deal with the importance of enhancing the skills of our employees. Once again, we have developed the 2000 Operational IT Plan in full coordination with all program and support areas and it has been approved by the U.S. Census Bureau's Information Technology Review Board. This review process is fully outlined in the Introduction to the Plan.

In each section of the Plan, we describe a program area and give details about their business; their products, services, and customers; and, most importantly, how IT supports them and what IT resources they will need for Fiscal Years 2000 and 2001. Given the nature of the U.S. Census Bureau's work (i.e., censuses and surveys), new initiatives/ projects are not the norm; rather, up-

dating and/or augmenting existing survey systems is more prevalent.

This Executive Overview provides a brief description of the U.S. Census Bureau's IT environment, the program areas' plans and needs, how we will measure success, how we will implement a "Digital" Commerce, how we are solving the Y2K problem, the risks to our programs, and our security efforts.

Enterprise IT Support

The IT Directorate is responsible for providing the guidance and the framework that IT professionals in the program areas use to complete their tasks. The IT Directorate has technical and management areas working together to support enterprise initiatives, business processes, and the U.S. Census Bureau's IT goals and strategies.

Our current IT architecture has expanded to include business processes, applications, and data that use the technical infrastructure. It provides an evolving set of IT standards, services, protocols, and products that define the target environment and guide future IT efforts. Our future IT architecture will continue to move the U.S. Census Bureau from a centralized mainframe environment to a managed, distributed open-systems environment.

The Bowie Computer Center is a reliable, state-of-the-art processing facility providing centralized computing that supports the U.S. Census Bureau program areas. Many workstation servers and file and database servers, as well as an Internet access point and the data transmission prototype, still reside in multiple locations at the U.S. Census Bureau's Suitland, Maryland site. However, we have made significant progress in accomplishing one of our major goals, moving workstations and office automation servers from Suitland to Bowie. This activity is continuing as a coordinated effort between the IT Directorate and the program areas. The Bowie Computer Center is conducting systems management at the request of the program areas; some remain decentralized, while others are opting for full central management by the IT Directorate. Service Level Agreements document the customer/provider relationship and include appropriate performance metrics for Bowie Computer Center services. Consolidation of processing equipment at the Bowie Computer Center enhances our ability to ascertain our total hardware and software maintenance requirement, and will ensure the proper physical and operational environment for the U.S. Census Bureau's systems, including the development of enterprise-wide data backup, disaster recovery, and data archiving capabilities.

The need for a robust, reliable, scalable and secure network becomes increasingly important as we continue to move toward a future environment in which most internal and external transactions are performed electronically. We have upgraded old hub technology with high-speed ether-switches; we have also upgraded the communications bandwidth speeds for the Bowie Computer Center, Headquarters, the National Processing Center, and the telephone centers.

Consolidating workloads in a single site brings with it some risks that we can diminish with a comprehensive contingency plan for computer and telecommunication services and business continuity. A major IT activity is to develop such a plan that includes procedures to guide implementation at the application level. We completed our Contingency Plan study in FY 1999 and will implement a backup plan to include an alternate processing site prior to FY 2000. The current contingency plan covers only those operations in the Bowie Computer Center. We will continue to determine the alternative for contingency and disaster recovery that best meets the rest of our operations at other locations.

Program Area IT Support

Decennial Program Area

The Decennial program area is divided into six operational activities: Data Collection, Data Capture, Data Processing, Accuracy Coverage and Evaluation, Telephone Questionnaire Assistance, and Administrative Systems. The plan for Census 2000 incorporates government partnership, outreach, and the effective use of technology.

Due to a Supreme Court ruling, the U.S. Census Bureau cannot use statistical methods to determine Congressional Apportionments. Therefore, we will conduct a 100% Non-Response Follow-Up for those housing units that do not respond during the initial enumeration. This change will result in more personal visits in the field, more forms to be processed, and will require the Data Capture Centers to remain open longer to process the increased workload.

The U.S. Census Bureau must set up numerous temporary offices across the country to handle the large nationwide data collection effort. The major components of the national field infrastructure are 12 Regional Census Centers, 450 Census Field Offices, and 520 Local Census Offices. Not only must this foundation be able to complete an accurate enumeration in Census 2000, it must be effective and cost-efficient. By contracting out functions such as the Data Capture System and Data Capture Centers, we avoid the cost of purchasing equipment we will not need after Census 2000. Another added benefit will be the provided flexibility and scalability to handle the increased and changing requirements of conducting a traditional count census in the year 2000. Lastly, by using new technologies such as imaging and the Internet, we can gather and disseminate information more quickly.

Geography Division

The Geography division has two major IT components: The Geographic Support System (GSS), and the GSS Infrastructure. Geography's goal is to provide the basic maps, reference files, and associated processing systems needed to meet the geographic requirements of all U.S. Census Bureau programs. The GSS supports most of the U.S. Census Bureau's censuses and surveys.

The GSS architecture includes the following: enterprise systems at the Bowie Computer Center for maintaining the Topologically Integrated Geographic Encoding and Referencing (TIGER) database and the Master Address File; equipment at Regional Offices/Regional Census Centers; a replica of the complete Regional Census Center configuration at the Suitland, MD, Beta Site; continuing census operations at the National Processing Center in Jeffersonville, IN; and software development and major system administration from Headquarters.

Acquiring replacement hardware to process the TIGER database is critical to the success of all Geographic support efforts. The Geography Division needs updated hardware and software to meet the peak processing requirements of Census 2000 and the American Community Survey, to improve the capability of TIGER and the Master Address File, to produce large-format color maps for customers, and to allow for enhanced technology in Fiscal Years 2000 and 2001.

Replacing the obsolete systems such as the geographic information system is a goal of the Census Modernization initiative. As part of this initiative, we will do the following:

- **evaluate and select commercial off-the-shelf software to replace our Bureau-developed system;**
- **move our data to the commercial off-the-shelf database; and**
- **evaluate the use of satellite and other global positioning information systems to improve our ability to geographically locate housing units and business establishments.**

Data Access and Dissemination System (DADS)

The Data Access and Dissemination System (DADS) is comprised of two primary subsystems: American FactFinder and Data Products Production. These subsystems jointly comprise a suite of applications designed to provide responsive, multi-tiered, near-universal access to the U.S. Census Bureau's vast storehouse of data through a state-of-the-art, Internet-based, user-interactive interface implemented via current World Wide Web technology.

The American FactFinder allows users to select census products or submit queries against varied data sets to extract meaningful information and produce results, which can be in table or map form.

The Data Product Production subsystem will provide an interactive interface for designing, reviewing and generating 1998 Dress Rehearsal and Census 2000 data products. In addition, this subsystem will, based on these data products, generate a number of file output formats for printing, for stamping to CD-ROM, and for on-line Intranet/Internet access through the American FactFinder. The current DADS architecture is based on a three-tier computing model. Each tier performs a specialized function and is connected to the other tiers via the Internet or U.S. Census Bureau Intranet. These tiers are client platforms, application servers, and database and map servers. The DADS computing environment is centrally located at the Bowie Computer Center; sources inside and outside the U.S. Census Bureau supply hardware and software support. The continued investment in hardware and software to implement DADS ensures that DADS will provide all required functional support to an expected large customer base.

The U.S. Census Bureau is in the preliminary fact-finding stages of an Integrated Information Solution (IIS) project, of which DADS will be a part. The project defines the details of how the U.S. Census Bureau should proceed from DADS development to the full vision of an integrated information access and dissemination system for internal and external users. DADS plays a major part in the U.S. Census Bureau's new world of "Electronic Commerce." We have included IIS activities in our Census Modernization initiative.

Demographic Program Area

The Demographic program area provides survey methodology, data processing, data dissemination, and data analysis services for its customers. The UNIX environment is now the primary production and analytical processing resource for the Demographic area. We will, in the next five years, expand our use of information technology to modernize and/or improve our business processes. These efforts will require obtaining or developing additional IT resources such as computing equipment, peripheral devices, and improved application software.

The Demographic Directorate has requested the new initiative to improve their survey processes, but they include no significant IT investments through 2001. They will benefit from the data collection and dissemination activities included in the Census Modernization initiative.

Economic Program Area

The Economic program area is comprised of four parts: Economic Census and Surveys, Foreign Trade Statistics, Government Census and Surveys, and The Office of the Chief Economist. The Economic program area helps the public understand the U.S. economy and its competitive position in the global economy. Once every five years, the U.S. Census Bureau conducts the Economic Census. In addition, the Foreign Trade Division is the sole source of the official statistics on U.S. merchandise trade with foreign countries. The Governments Division provides statistical data on the organization, finances, and human resources of state and local governments throughout the U.S., undertaking a complete Census of Governments every five years as well as annual surveys and special studies. The Office of the Chief Economist provides analysis and research, resulting in better quality economic measures, as well as providing access to U.S. Census Bureau microdata to both the public and private sectors.

Currently, the Economic program area primarily uses enterprise computing to process its censuses and surveys. Our large-scale systems are located at the Bowie Computer Center on an open-system, UNIX environment. This supports the goal of using equipment that is modular in architecture, scalable, standards-based, redundant and sufficiently flexible and powerful enough to support a variety of different applications.

In FY 99 we completed a critically needed enhancement to upgrade the Office of the Chief Economist's network. This was vital to support timely movement of data extracts between computers and to help us successfully implement the Economic Microdata Warehouse prototype project. We will also upgrade the telecommunications infrastructure to improve Foreign Trade operations.

Acquiring additional equipment and more computing power, expanding network capacity, and improving application software will allow us to better meet the demands of our clients, customers, stakeholders, and the general public.

The Economic program area will see early benefits from the use of data capture scanning technology and data dissemination capabilities included in our Census Modernization initiative.

Field Operations

The Field Operations program area is divided into three major business areas that support U.S. Census Bureau data collection programs. The Technologies Management Office develops automated systems to facilitate data collection; the National Processing Center and the Field Division conduct the data collection activities. The decentralized field organization and variety of data collection methodologies require a distributed and flexible IT infrastructure (the Field Integrated System). Our objective over the next five years is to move to state-of-the-art hardware and software technologies. Implementing new hardware and re-

designed software will improve the functionality and integration of all the Computer-Assisted Interviewing technologies.

The National Processing Center, in Jeffersonville, IN, is a multi-functional data capture and processing site. To support its primary business, the National Processing Center currently maintains sixteen unique server and processing environments. The National Processing Center is a very large and logistically complex facility, and each survey environment requires a variety of hardware architecture and software system configurations. The National Processing Center has an ongoing requirement for life-cycle hardware replacement. Other IT-related requirements include additional microcomputers, file servers, and printers to support increased workloads as well as Local Area Network and software upgrades.

Census Modernization activities addressing updating assisted survey instruments, including replacement of the DOS-based survey instrument, will directly benefit the Field Operations program area.

Finance and Administration Program Area

The main business of Finance and Administration is to provide administrative support to the U.S. Census Bureau. This includes implementing, deploying, and maintaining all components of the Commerce Administrative Management System (CAMS), the Publications and Forms Design System, and systems in the Human Resources Division and Equal Employment Opportunity Office.

CAMS is the vehicle through which the U.S. Census Bureau will meet the requirements of the Chief Financial Officers Act, Government Management Reform Act, and the Acquisition Streamlining Act.

The current CAMS architecture, includeing telecommunications, is centralized and managed by the IT Directorate. Implementing an effective, integrated financial management system will help the Department of Commerce provide sound financial audits. The heightened implementation of CAMS and its accelerated deployment throughout the U.S. Census Bureau requires that we upgrade its architecture. Therefore, in FY 2000 we will update the current CAMS hardware and implement hardware updates in FY 2002. Between now and 2002 we will also increase our disk storage to keep up with system growth.

The Publications and Forms Design System is primarily decentralized; however, the IT Directorate provides mainframe/minicomputer and desktop resources. We are replacing hardware and software as new technology is introduced in the publications, graphics/forms design and production areas.

Methodology and Standards Program Area

The Methodology and Standards program area includes coverage of three major components. Computer-Assisted Survey Information Collection focuses on improving how surveys and censuses are designed, conducted and managed, using a set of automated tools to improve data quality, timely reporting and cost-effectiveness. The Integrated Statistical Laboratory gives researchers the power and flexibility to utilize multiple operating systems, many users and large files and databases. The Administrative Records Research System is a computer-based research system designed to expand statistical uses of administrative records to improve coverage of censuses and surveys, to reduce respondent burden and costs, and to generate new information not otherwise available.

As part of our ongoing research efforts to improve business processes, we have established a team within the Computer-Assisted Survey Research Office to enable us to evaluate new techniques envisioned for current business processes. We need hardware, software, and contractor services to successfully complete these tasks.

The Integrated Statistical Laboratory will continue to need upgrades and replacement hardware to remain consistent with standards, updated technology, and requirements for additional disk storage for enhanced tape backup.

Computer-Assisted Survey Information Collection is the U.S. Census Bureau's program to transform our business processes—collection and processing—by making the greatest possible use of automation and telecommunications. This program will result in economic gains by supporting additional workloads and providing quicker access to data that affects Congressional and Presidential policy decisions.

The Computer-Assisted Survey Research Office is working with other U.S. Census Bureau organizations to design and implement a data dissemination capability, via the Integrated Information Solutions program, that will provide customers with as many options as possible to access census information. This Office supports the development of a Bureau-wide Corporate Metadata Repository that will provide the metadata needed to share data across the organization and disseminate information to external users. Our strategy is to provide one general electronic system for customers to access census and survey data, to create customized products, and to acquire pre-designed products. Approval of our Census Modernization initiative is critical to this effort.

Milestones

We have included key milestones for IT activities, including acquisition time frames, for each program area to cover Fiscal Years 1998 through 2003. The fiscal year for milestones is determined by their estimated completion date, or actual completion date (if known) and different. We review these milestones for progress and/or completion at least quarterly throughout the year.

Performance Measures

The IT Directorate has developed its performance measures for Enterprise IT Support using the Balanced Scorecard. We have focused our measures on Operational aspects that link directly to our Strategic IT Goals and Strategies. The Operational Balanced Scorecard is comprised of those aspects that will meet the expectations of our customers, provide innovation and technical capabilities that will ensure workforce competency and meet U.S. Census Bureau business requirements, and reflect internal processes which the IT Directorate must excel in to deliver customer value and satisfaction. We have reported our current performance in the Enterprise IT Support section of this Plan.

Each program area has identified measures to assess performance improvements for their IT-related business. We have attempted to develop outcome measures that will indicate results of the initiatives in place. Many of the program areas are product-driven and therefore, have measures that are more output and time-oriented. We have come a long way toward understanding the intent of the Government Performance and Results Act and have put considerable effort into developing measures that will add value to U.S. Census Bureau programs. We have spent considerable time over the past year reviewing those performance measures that were originally reported in the 1999 Operational IT Plan. We discovered that there were many measures that were not IT-related and we have revised those measures accordingly. We developed the associated metrics and continue to establish the baselines necessary to determine if the measures are valid and reportable. Where we have baseline data, we have reported our progress in the respective program area sections of this Plan.

Risks

There are two prevalent risks that continue to remain foremost in the program areas:

The first risk is obtaining and retaining qualified programmers and support staff. It continues to be difficult to compete with the current labor market. We are mitigating this risk by defining clear career paths and certification programs for our employees. We will also take advantage of incentive programs that are offered through Office of Personnel Management and the Department of Commerce. In addition to relying on the U.S. Census Bureau's internal work

force, we will use contractor support, particularly to obtain highly specialized skills and flexibility in the number of workers that can be added or removed as the workload fluctuates. To this end, we recently awarded contracts to several small businesses to provide IT services to the Bureau.

The other risk is a single point of failure at the Bowie Computer Center. We are mitigating this major risk by developing a Contingency Plan to activate in the event of a disaster. We are contracting "hot site" support for mission critical systems. The program areas will continue to participate in developing this Contingency Plan by ensuring that systems requirements are kept up to date.

We discuss these and other program area risks in each section of the Plan, in terms of the risks of implementing a new IT activity or not, as appropriate.

Supporting a "Digital Department of Commerce"

Across the U.S. Census Bureau, we are quickly moving from paper to "digital" technology, providing customers with more choices for data access and improving public trust in data protection and communications. The U.S. Census Bureau is positioned strategically to demonstrate how the Department of Commerce has made tremendous strides as a recognized leader in technology.

You will find examples of how the program areas are actively moving toward a digital operation within each of their respective sections in this Plan.

We are committed to making the entire U.S. Census Bureau a model of electronic commerce, and strongly support the goals of the E-Commerce Department of the 21st Century, and the American Disabilities Act!

In any future endeavor, we will focus more attention to public access of our information by disabled individuals.

Financial Data

Included in Appendix A of this Plan is an Exhibit 42 with 11 systems (included our Census Modernization initiative). We have formulated our costs using a different set of criteria than in last year's Plan. This year, we asked the program areas to more specifically define what we should report as their total IT costs; we also concentrated on learning the cost of the functions being performed.

We describe our IT requirements for the U.S. Census Bureau as a whole and for each program area individually; we then describe our Census Modernization initiative. Finally, we provide "Raines Rules" information for systems on Exhibit 42 and answer additional investment questions posed by the Department of Commerce.

Solving the Y2K Problem

We successfully met the Office of Management and Budget's March 31, 1999 deadline for fixing and testing 60 mission critical systems for Year 2000 readiness. In addition, we have completed scanning approximately 6,000 desktop PCs and some 3,000 notebook PCs using the Check 2000 Client Server package from Greenwich Mean Time UTA.

A contractor is performing independent validation and verification of mission critical systems that we have reported as compliant; this effort will continue throughout the calendar year.

We have included information on our Y2K efforts in Appendix B of this Plan.

Security

The U.S. Census Bureau fully complies with the Department of Commerce's IT Security program requirements. The ADP Security Branch of the Finance and Administrative Directorate maintains a current inventory of all sensitive systems within the U.S. Census Bureau, ensuring that security plans, risk assessments, and contingency planning documents are current. We have provided detailed information on our security program in Appendix C of this Plan.

We are participating with the Department of Commerce in a national evaluation of our critical infrastructure. The identification of the critical components is currently underway; that is to be followed by implementing a protection plan. This Operational IT Plan, and its accompanying budget request, cannot include funding requests for that which is still undefined. We are taking a variety of actions to protect our systems and networks, but specific implementation of a Critical Infrastructure Protection Plan may require additional funding.

Concluding Remarks

Whether employees are assessing survey results, answering customer questions or providing services for economic and statistical data, the quality, accuracy and efficiency of their efforts depend on their ability to quickly and accurately access and organize information in a useful format, and disseminate data using IT products and services. With this in mind, the U.S. Census Bureau is focusing on a strategic direction to develop an IT environment for itself, our business partners and the public, where economic and statistical information is collected and captured cheaply and accurately, managed effectively, used often and quickly disseminated. The U.S. Census Bureau will evolve over time to electronic collection and dissemination, whereby most internal and external transactions are performed online. These changes that are occurring within the U.S. Census Bureau are rapid and dynamic. This document is clearly designed to be the plan for operational improvements within the IT environment of the U.S. Census Bureau.